height of each first electrode, B^1 is an electrode width thereof, C^1 is a width of an interelectrode space for the first electrodes, A^2 is a height of each second electrode, B^2 is an electrode width thereof, C^2 is a width of an interelectrode space for the second electrodes, provided that $B + C = B^1 + C^1 = B^2 + C^2$, and X is a thickness of the electroconductive adhesive layer prior to connection." Tsukagoshi does not teach or suggest such a method.

The Office Action asserts that Tsukagoshi discloses conductors 5 on a substrate 7 and conductors 6 on a substrate 7, the conductors 5, 6 being electrically connected by an adhesive layer 4. The Examiner further asserts that Tsukagoshi discloses that the thickness of the adhesive film can be determined based on the particle size of electroconductive particles and properties of the connecting material, and further discloses a preferable thickness of between 3 and 100 nm. The Office Action concedes that Tsukagoshi fails to disclose the claimed relationship between the thickness of the adhesive layer and the height of, width of and spacing between the electrodes, but asserts that it would have been obvious to provide a structure according to Tsukagoshi meeting the claimed relationship, as the claimed relationship merely represents optimization of result effective variables.

At the outset, it is undisputed that Tsukagoshi does not disclose the relationship between the thickness of an electroconductive adhesive layer prior to connection of first and second electrodes, and the height, width and interelectrode space of those first and second electrodes of claim 2. To sustain a *prima facie* case of obviousness, it must be demonstrated that one of ordinary skill in the art would have been motivated by the teachings of Tsukagoshi to connect electrodes using the connection method of claim 2. To make its case, the Office Action relies on the rule that the discovery of an optimum value of a variable in a known process is normally obvious. See, e.g., In re Antonie, 559 F.2d 618, 620 (C.C.P.A. 1977). An exception to this rule, however, is provided in the instance where unexpectedly good results are achieved by optimizing such a variable. Id. In the instant case, (1) the relationship

between the thickness of an electroconductive adhesive layer prior to connection of first and second electrodes, and the height, width and interelectrode space of those first and second electrodes is not recognized in Tsukagoshi as a result effective variable and (2) the instant specification demonstrates that unexpectedly good results are achieved when electrodes are connected according to the connection method of claim 2.

The Office Action asserts that the relationship set forth in claim 1 represents a result effective variable because "Tsukagoshi clearly disclosed [sic] that there is a clear relationship between the conductor space and the size of the electorconductive particle to prevent leak (col. 7) and the thickness of the particles have direct [sic] relationship with the thickness of the adhesive (col. 10)." December 31, 2003 Office Action, p. 3. The passage of Tsukagoshi at column 7 identified in the Office Action states:

> When the average particle size (diameter) is less than 0.5 μm, a large amount of the electroconductive particles become necessary, which results in increasing the packing particle number and undesirably lowering the adhesiveness to the conductors. On the other hand, when the average particle size (diameter) is larger than 300 μm, spaces between adjacent conductors are connected so as to leak due to the largeness of the particles, so that such particles cannot be used for connecting fine conductors. In order to prevent the generation of leak, it is necessary to select electroconductive particles having a smaller particle size than the space of conductors to be connected. Considering safety, it is preferable to use electroconductive particles having a maximum particle size of 1/2 to 1/4 of the space width of conductors.

C7/L19-29. The Office Action correctly states that this passage suggests a relationship between the spaces between the conductors and the size of the electorconductive particles. However, this passage provides no guidance with respect to a relationship between the thickness of the electroconductive adhesive layer prior to connection of first and second electrodes, and the height, width and interelectrode space of those first and second electrodes. Even with respect to the alleged relationship between the spaces between the conductors and the size of the electroconductive particles, the passage does not provide any guidance with respect to the height or width of the conductors. Moreover, the passage does not provide any

guidance with respect to the relationship between the spaces between the conductors on opposing substrates that are to be connected. The parameter described in this passage has an incomplete or at least extremely tenuous connection with the relationship expressed in claim 2.

The passage of column 10 identified in the Office Action states:

> The thickness of the adhesive film can be determined considering the particle size of electroconductive particles and properties of connecting material. Preferable thickness is 1 to 300 μm. When the thickness is less than 1 μm, sufficient adhesiveness cannot be obtained, while when the thickness is more than 300 μm, a larger amount of electroconductive particles are necessary in order to obtain sufficient electroconductivity; this is not preferable from the viewpoint of practical use. More preferable thickness is 3 to 100 μm by the same reasons as mentioned above.

C10/L13-23. The Office Action relies on this passage to provide a connection between the adhesive layer thickness parameter and the conductor space parameter described in the previous passage. The passage indicates that the thickness of an adhesive film is dictated by the size of the particles provided therein. The Office action intimates that the statement in the previous passage that it is preferable to use electroconductive particles having a maximum particle size of 1/2 to 1/4 of the space width of conductors, coupled with the indication in this passage the adhesive film width is related to the particle size indicates that Tsukagoshi implicitly recognized the relationship between the thickness of an electroconductive adhesive layer prior to connection of first and second electrodes, and the height, width and interelectrode space of those first and second electrodes. The connection, again, is tenuous at best. First, the relationship defined in claim 2 has nothing to do with electroconductive particle size. Second, like the previous passage, this passage provides no guidance with respect the height or width of the conductors or the relationship between the dimensions of conductors on opposing substrates that are to be connected.

Tsukagoshi simply fails to appreciate that the relationship between the thickness of an electroconductive adhesive layer prior to connection of first and second electrodes, and the height, width and interelectrode space of those first and second electrodes is in any way result effective. This failure is further evidenced by the Examples of Tsukagoshi. In no instance are the effects of the dimensions of the conductors on the performance of the resulting connections considered. See generally C13/L31-C28/L63. As Tsukagoshi does not recognize the claimed relationship as result-effective, a *prima facie* case of obviousness based upon the reasoning that the claimed relationship is merely optimization of known parameters cannot be sustained.

Moreover, the instant specification provides ample evidence indicating that unexpectedly good results are achieved when the relationship between the thickness of an electroconductive adhesive layer prior to connection of first and second electrodes, and the height, width and interelectrode space of those first and second electrodes, as set forth in claim 2, is abided. The instant specification provides three separate sets of experimental data illustrating the superiority of connections made by the method of claim 2 over connections made using adhesive layers and electrode dimensions falling just outside the relationship set forth in claim 2. In every instance, the connections made by the method of claim 2 provide superior results in the areas of conduction resistance, adhesion strength and resistance to shorting. See Table 1, p. 14; Table 2, p. 15; Table 3, p. 18. The criticality of the relationship set forth in claim 2 rebuts any alleged *prima facie* case of obviousness.

Because (1) the relationship between the thickness of an electroconductive adhesive layer prior to connection of first and second electrodes, and the height, width and interelectrode space of those first and second electrodes is not recognized in Tsukagoshi as a result effective variable and (2) the instant specification demonstrates that unexpectedly good

results are achieved when electrodes are connected according to the connection method of claim 2, Tsukagoshi does not teach or suggest the connection method of claim 2.

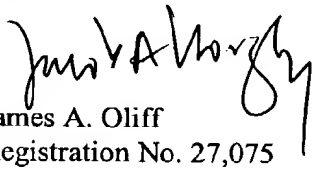
Tsukagoshi would not have rendered claim 2 obvious. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claim 2 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Jacob A. Doughty
Registration No. 46,671

JAO:JAD/hs

Date: March 12, 2004

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461